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| 10/849,571 | 05/20/2004 | Weidong Zhu | UMBC-0015 | 6579 |
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| KED & ASSOCIATES, LLP | | | NGHIEM, MICHAEL P | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-----------------------------------|--|
| Office Action Summary | Application No. 10/849,571 | Applicant(s) ZHU ET AL. | |
| | Examiner Michael P. Nghiem | Art Unit 2863 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15, 16 and 47-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 56-59 is/are allowed.
- 6) ☒ Claim(s) 15, 16, 47-55, 60 and 61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The Response filed on March 27, 2007 has been acknowledged.

Withdrawal of Allowability

The indicated allowability of claims 15, 16, and 51-54 is withdrawn in view of the new ground of rejections as follow.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 48, 50, and 61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

"The higher order perturbation process" (last two lines) lacks antecedent basis. Which order process is it being compared to?

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15, 16, 47-54, 60, and 61 are rejected under 35 U.S.C. 102(e) as being anticipated by Weiss et al. (US 2003/0013541).

Regarding claims 15, 47-52, 60, and 61, Weiss et al. discloses a system (Fig. 19) for determining stiffness parameters of a structure (shaft 110, paragraph 0057), comprising:

- a sensor (1877) arranged to measure vibrations of said structure and output vibration information (paragraph 0116, lines 1-2);
- a stiffness parameter unit (62) for receiving said vibration information (paragraph 0116, lines 1-3), determining natural frequency data or mode shape (vibration frequency, paragraph 0116, lines 4-5; paragraph 0016, lines 6-8) of said structure (paragraph 0116, lines 2-5), and determining the stiffness parameters of said structure using said natural frequency or mode shape data (paragraph 0116, lines 4-5; paragraph 0016, lines 6-8);

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Regarding claims 15 and 51, Weiss et al. further discloses a damage information processor (61) for receiving said stiffness parameters and outputting damage information (data for non-perfect shaft vs. data for perfect shaft displayed via 257, paragraph 0159, lines 18-22, Fig. 25).

Regarding claims 16, 52, and 54, Weiss et al. discloses said damage information processor outputting damage location information (damage is at location of shaft, paragraph 0159, lines 20-22).

Regarding claims 47-49 and 60, Weiss et al. further discloses determining said stiffness parameters using a first order perturbation process (paragraph 0066, lines 8-13).

Regarding claims 48, 50, and 61, Weiss et al. further discloses determining said stiffness parameters using a higher order perturbation process (paragraph 0141, lines 13-18). Note the first order process, paragraph 0066, lines 8-13, is a higher order than a zero-order process.

Regarding claims 53 and 54, Weiss et al. further discloses a damage extent processor (61) for determining extent of damage information (257 shows deviations between data of non-perfect shaft and data of perfect shaft, Fig. 25).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weiss et al. in view of Gibson et al. (US 5,533,399).

Weiss discloses all the claimed limitations as discussed above except said stiffness parameter unit comprises a spectral analyzer.

Nevertheless, Gibson et al. discloses a spectral analyzer (22) for the purpose of obtaining resonance frequencies and modal shape indices (column 2, lines 35-41). A spectral analyzer is an effective tool for achieving said purpose.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Weiss et al. with a spectral analyzer as disclosed by Gibson et al. for the purpose of obtaining resonance frequencies and modal shape indices.

Allowable Subject Matter

Claims 56-59 are allowed.

Reasons For Allowance

The **combination** as claimed wherein the random impact device comprises: a random signal generating unit for generating first and second outputs; a random impact actuator for receiving said first and second outputs; and an impact applicator coupled to said random impact actuator and having an impact region; wherein said random impact actuator drives said impact applicator such that the force and arrival times of said impact applicator at said impact region are random (claim 56) is not disclosed, suggested, or made obvious by the prior art of record.

Response to Arguments

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

Any inquiry concerning this communication or earlier communications from the

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examiner should be directed to Michael Nghiem whose telephone number is (571) 272-2277. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



MICHAEL NGHIEM
PRIMARY EXAMINER

Michael Nghiem

June 3, 2007